A numerical model for the thermal history of rocks based on confined horizontal fission tracks - DTU Orbit (08/11/2017)

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A numerical model for determination of the thermal history of rocks is presented. It is shown that the thermal history may be uniquely determined as a piece-by-piece linear function on the basis of etched confined, horizontal fission track length distributions, their surface densities, and the uranium content. The initial track length distribution is taken into account. A relation between the measured track length distribution and age is given which includes correlation for partial annealing. The annealing model used is the fanning Arrhenius plot. It is shown that track length distributions measured in transmitted light are biased favouring short tracks compared with measurements in reflected light. Testing of the model is performed on apatites from a tuffaceous sandstone from Bornholm (Denmark) yielding an estimate of the thermal history for the period of about 280 Ma back in time.

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